LIBRARY
STATE PLANT BOARD

February 1, 1938
(for December 1937)

UNITED STATES

DEPARTMENT OF AGRICULTURE

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

VOLUME V

No. 2

Digitized by the Internet Archive
in 2013

http://archive.org/details/newsletter37no2

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR DECEMBER 1937

Vol. V, No. 2 (Not for publication) February 1, 1938

W. E. LEER

Wayne E. Leer, associate pathologist and Bureau representative in charge of the barberry-eradication program in Indiana, died at the Home Hospital in Lafayette, Ind., on January 2, 1938, following an illness of several weeks' duration. His wife, Elizabeth P. Leer, and two daughters, Jean Frances and Virginia Anne, survive him.

Mr. Leer was born at Fairmount, Ind., on June 5, 1897. In 1919 he received the degree of Bachelor of Science in Agriculture from Purdue University and in 1923 he received the M. S. degree from the University of Illinois. Since then he has held the position of State leader of barberry eradication in Indiana, with headquarters at Purdue University.

Mr. Leer was a member of Epsilon Sigma Phi, an honorary fraternity of agricultural extension workers, also of Alpha Zeta, Sigma Delta Chi, and Kappa Delta Pi fraternities.

FRUIT INSECT INVESTIGATIONS

Headquarters for peach-orchard-insect survey moved.--The headquarters for the survey of insects in peach orchards in connection with the peach mosaic problem were moved, effective December 1, from Riverside, Calif., to San Bernardino, Calif., and were consolidated with the suboffice of the Division of Domestic Plant Quarantines at that point. L. D. Christenson is in charge of the survey work and is assisted by Laurence Jones.

Two generations of peach borer in Georgia.--O. I. Snapp and J. R. Thomson, Jr., Fort Valley, Ga., report that during the 1937 season they reared second-generation adults of the peach borer in peach trees under normal orchard conditions. The number reared was small in comparison to the total borer population.

Succession of insects in raisins.--A stack of 12 tons of Thompson Seedless raisins of the 1936 crop was sampled by H. C. Donohoe, of the Fresno, Calif., laboratory, at intervals of 4 weeks, beginning March 24 and ending October 4. The following table presents a summary of succession of all species and all stages of insects found.

LIBRARY
STATE PLANT BOARD

[illegible]

Date 1937	Infestation per ton							
	Raisin moth	Indian-meal moth	Saw-toothed grain beetle	Cryptophagus insoitus	Dermestidae	Cephalonomia tarsalis	Misc. including Microbracon	Total (all species)
3/24	1,350	400	1,400	600	0	0	0	3,750
4/21	850	300	8,500	550	0	0	0	10,200
5/19	350	700	213,050	500	0	0	150	214,750
6/16	200	2,200	178,150	0	0	0	50	180,600
7/14	150	700	79,900	0	50	6,350	150	87,300
8/12	250	850	24,600	0	500	1,000	50	27,250
9/8	350	2,000	15,100	0	900	1,250	400	20,000
10/4	100	2,550	6,650	0	450	350	350	10,450

Of especial interest are the dominance of the saw-toothed grain beetle; the appearance of *Cephalonomia tarsalis* Ashm., a parasite of its larvae, in the samples taken in July and later; the disappearance of *Cryptophagus insoitus* Casey after the May sampling date; the appearance of dermestids in July; and the typical dwindling of the raisin moth population during the year following harvest. The table supports other evidence which points to the inability of the Indian-meal moth to become abundant in the presence of an infestation of the saw-toothed grain beetle.

Organisms of milky diseases of Japanese beetle larvae viable after 25 months in soil.--In October 1935 the late G. F. White buried samples of soil contaminated with organisms of the milky diseases of Japanese beetle larvae in outdoor plots. The plots throughout this period have been protected so as to prevent any Japanese beetle larvae from being in the plots. Recently R. T. White and S. R. Dutky, of the Moorestown, N. J., laboratory, have tested these soil samples on healthy larvae, to determine whether the disease organisms are still viable. The results of the tests show that the disease organisms are still viable, after 25 months, both types of the disease, types A and B, developing in healthy grubs feeding in the soil samples.

Normal depth of soil population of Japanese beetle.--I. M. Hawley and T. N. Dobbins, Moorestown, have completed a summary of data on the depth of the soil-inhabiting stages of the Japanese beetle in turf in the older infested New Jersey-Pennsylvania area. Records are available on a total of 213,037 individuals over the period from 1925 to 1935. Over 90 percent of the larvae normally hibernate at depths of from 2 to 6 inches, with the greatest number in the 2- to 4-inch layer of soil. During 5 of the years covered by the surveys, no larvae were found below 8 inches, whereas in the other 5 years only 56 larvae were found as deep as the 8- to 10-inch layer of soil. The data given apply only to larvae in turf. In cultivated fields, where the soil is of a looser texture and where soil temperature and moisture conditions are somewhat different, the larvae often move to greater depths.

Overwintering strawberry leaf roller a reservoir for hibernating parasite.--For a number of years large quantities of material of *Macrocentrus ancylivorus* Rohw. for distribution in colonization of the oriental fruit moth parasite have been obtained from strawberry leaf roller in the immediate vicinity of Moorestown, N. J. The great reduction of strawberry acreage in that vicinity has made it desirable to look elsewhere for supplies of leaf roller parasitized by Macrocentrus. H. W. Allen and W. P. Yetter, Jr., of the Moorestown, N. J., laboratory, have recently completed a survey extending from Norfolk, Va., to Moorestown, N. J. It has been found that strawberry leaf roller occurs in varying degrees of abundance at all points between these two locations in which cultivated strawberries are grown. It has also been found that M. ancylivorus occurs in fair abundance in the overwintering strawberry leaf roller at most of the localities sampled. At Moorestown strawberry fields are sparse, the overwintering leaf roller is moderately abundant, and the overwintering Macrocentrus is unusually abundant, parasitizing more than 60 percent of the larvae in some fields. Strawberry leaf rollers are very abundant and strawberry acreage extensive about Bridgeville, Del., and the parasitization by Macrocentrus is about 20 percent. The strawberry leaf roller infestation from Pocomoke to Cape Charles is from moderate to scarce, although the strawberry fields are abundant and the Macrocentrus parasitization at places is in excess of 50 percent. At Norfolk, Va., the leaf roller is scarce, but parasitization by Macrocentrus is about 15 percent.

MEXICAN FRUITFLY CONTROL

Mexican fruitfly caught in lower Rio Grande Valley.--Inclement weather throughout most of December seriously interfered with field activities on the Mexican fruitfly project. In spite of bad working conditions, however, the month's trap catch was one of the highest on record. Anastrepha ludens Loew. was taken for the first time since July, 11 of this species having been trapped in the groves and brush. The population of Anastrepha serpentina Wied. diminished only slightly from the high mark of last month, and Anastrepha sp. "Y" increased from 12 in November to 106 during this period. To date none of the adult A. ludens trapped have been gravid nor have any larvae been found in the fruit. Fruit shipments for the season total approximately 7,650 equivalent carloads by rail, truck, and steamer. The numbers and species of fruitflies identified during December are shown in the following table.

Species	Texas	Mexico
Adults	Number	Number
A. ludens------------------------	11	0
A. serpentina--------------------	508	7
A. sp. "L"-----------------------	15	0
A. sp. "X"-----------------------	1	1
A. sp. "Y"-----------------------	106	3
A. sp. "C"-----------------------	2	0
A. sp. "Z"-----------------------	1	0
A. sp. "n. sp."------------------	5	0
A. pallens Coq-------------------	975	73
Miscellaneous--------------------	22	4
Total----------------------------	1,646	88
Larvae		*
A. serpentina--------------------	0	*55
Rhagoletis sp--------------------	0	31
Total----------------------------	0	86
Grand total----------------------	1,646	174

*From market fruit.

JAPANESE BEETLE CONTROL

Fall shipping season nears end.--Inspectors in the Philadelphia, Pa., district reported that fewer plants were certified for shipment to points outside the regulated area this month than last, and that the peak months for the year 1937 were April and November, over 1½ million plants having been shipped during each of these months.

Preparations for spring shipping season.--Many establishments are digging and storing plant stock intended for shipment in the spring. Premises of classified dealers were closely checked for the presence of uncertified stock which had been received but not reported as required. In order to insure several carloads of stock, received by a large establishment at Princess Anne, Md., from States outside the area, against possible infestation, a certified storage shed was provided by erecting a 10-foot partition of solid boards in a large general storage shed located on the premises, thus separating certified and uncertified material.

More quarantine violators successfully prosecuted.--Seven violators of the Japanese beetle quarantine regulations were successfully prosecuted in December. All but one of the violators convicted this month were among those caught with uncertified farm products by the inspector stationed at the public market in Rochester, N. Y., last summer. One of those who had pleaded not guilty at the special session of the district court called last month at Rochester changed his plea to guilty and was ordered to pay a fine of $25. Fines of $25 each were also paid by four violators resident in New Jersey who pleaded guilty to identical charges in Federal Court held at Camden, N. J. Similar disposition was made of a single case at Buffalo, N. Y. Misuse of Japanese beetle certificates on two shipments of ivy destined to Florida was the charge to which the sixth violator pleaded guilty in the district court session held in New York City. A fine of $50 on each of the two counts was remitted by the court in view of the defendant's clear record over a period of many years.

New strawberry plant treatment authorized.--Successful experiments conducted since early last spring with methyl bromide as a fumigant for strawberry plants have led to the authorization of this treatment by the Bureau. A large nursery in Salisbury, Md., is now consulting with representatives of this Division concerning the erection of a suitable fumigation shed for such treatments. The newly authorized treatment is expected to save much labor without impairing the quality of the plants.

Quarantine hearing will not be called.--From a study of the data obtained during the last trapping season, it appears that only local extensions of the regulated area will be necessary at this time. In lieu of a quarantine hearing, which will not be necessary this year, the Bureau has distributed a statement which summarizes the results of the season's trapping in nonregulated areas. Accompanying the statement is a detailed trapping report by States, including comparative data, where available, of beetle catches in this and previous seasons.

Cold weather permits scouting and clear-cutting in swampy areas.--New Jersey Dutch elm disease scouts took advantage of the frozen swamps to scout a number of such areas, which are practically inaccessible when not frozen over. Clear-cutting work in the four major swamp areas in New Jersey made rapid progress. Swamps were sufficiently frozen to permit tractor units to work with little interruption for several weeks. In a single work week of 4 days, a total of 16,619 trees were removed in these areas. Of this number 11,487 were removed from the 5 work sites in Morris County.

Removal of sickly and inaccessible trees.--Elms in infected areas difficult to scout and all dead and dying trees in the major infected work area are being rapidly eliminated. In areas scheduled for clear-cutting, approximately 845,000 elms were removed this year, as compared with less than half that number last year. Over half a million dead and dying trees in the major infected area were also removed in 1937. At the end of the year approximately 375,000 trees tagged for removal remained standing. This compares with approximately 634,000 trees tagged DT standing at the beginning of the year. During the 12 months ended December 31, 1937, DT scouts tagged approximately 334,000 trees for removal. The total number of trees removed in clear-cutting, eradication, and sanitation activities was approximately 1,550,000 in 1937, as compared with approximately 1,270,000 removed in 1936. To December 31, 1937, a grand total of 3,833,454 trees have been removed in all activities. By far the largest number of these, 2,298,504, were removed in the New Jersey infected area.

Logs confirmed as Graphium infected.--During the first week of the month confirmation was reported of specimens obtained from one of a group of logs located on the grounds of the Rockland State Hospital, N. Y. The logs had been cut from a nearby point on the same property.

Inspection of Christmas trees and greenery completed.--Although final reports of Christmas-tree and greenery inspections in the New England States have not yet been compiled, it is evident that the wholesale market for this material was as good if not better than last year. The quality of the trees, however, was rather poor. Recutting over a period of years in the same localities of the lightly infested gypsy moth areas, to which cutting is restricted, has resulted in a scarcity of the best grades of trees. Thinning of needles observed on trees offered for inspection in the Maine areas was attributed by inspectors to feeding by the European spruce sawfly. An appreciable increase was noted in the quantity of material intended for manufacture into Christmas wreaths and decorative pieces requiring inspection. Many tons of fir balsam boughs, later cut into small pieces for use in the manufacture of Christmas wreaths, required piece-by-piece inspection because of increased gypsy moth infestation conditions throughout the regulated area. In some instances inspectors found balsam boughs so heavily infested that they denied certification and advised the owner to collect other boughs elsewhere. Increased infestation in the fir balsam areas of Maine is making it more difficult each year to properly inspect such wreath material and to certify that the completed wreaths do not include uninspected material.

Historic granite is inspected.--A piece of granite obtained from the premises of the birthplace of John Greenleaf Whittier, at Haverhill, Mass., required gypsy moth inspection and certification for shipment to Battle Creek, Mich. The granite was shipped by the Haverhill Historical Society and is to be placed on a historic monument.

FOREST INSECT INVESTIGATIONS

Minimum air temperatures in eastern Oregon forests.--J. M. Whiteside reports that on December 3, 1937, the first readings were taken in an experiment being conducted by the Portland, Oreg., laboratory, to determine the variation in the minimum air temperatures over a large area of ponderosa pine on relatively flat terrain. The spread in the temperatures recorded by 50 thermometers placed in pairs at random over an area of 8 townships on the Deschutes National Forest, Oreg., was 12° (10° to 22° F.), with the elevation ranging from 4,500 to 5,300 feet over the 800-foot area. However, owing to local conditions, the lowest temperature was recorded at 5,000 feet and the highest minimum at 5,300 feet. When compared with similar readings taken in 1936 on the Ochoco National Forest, Oreg., a considerable difference is noted. On November 2, 1936, a spread of 18° (-2° to 16° F.) was recorded, but with an elevational difference (3,600 to 5,800 feet) over the 2,200-foot area. Here the lowest temperature occurred at 4,400 feet and the highest minimum at 4,800 feet. It is evident from these observations that local differences in topography are potent factors in influencing the air temperatures that exist at any given point during periods of cold weather. This seems to be true on both broken and flat forested areas.

Locust borer infestation in Spokane, Wash.--J. C. Evenden, of the Coeur d'Alene, Idaho, laboratory, reports that the locust borer infestation in Spokane, which was first recorded in 1931, has increased in severity during the last few years, and that trees on a much larger area are now being attacked. City officials and officers of the Soil Conservation Service are showing interest in this situation and plans are being formulated for the institution of control in the spring of 1938.

Forest tent caterpillar decreased in Northeast.--J. V. Schaffner, Jr., of the New Haven, Conn., laboratory, reports that collections of egg clusters of the forest tent caterpillar were made between November 30 and December 3 in 14 localities in Vermont and 1 in Massachusetts to obtain data on the parasitization of the eggs and also on the present population. The data obtained indicate that the infestation has decreased at six points and increased at three, where collections were made in both 1936 and 1937. A general decrease was anticipated, owing to the epidemics of disease of the caterpillars noted last summer, which materially cut down the extent of defoliation throughout the entire area. The egg-cluster records indicate, however, that this pest is still a potential menace to the sugar orchards and hardwood forests in many localities and, in general, that the outbreak is not yet under control. In at least five sugar orchards heavy cutting operations of dead and severely weakened trees were noted. Complete mortality resulting from 1 to 3 consecutive years' defoliation is not always the case, but very often the entire center of the crown succumbs.

Second recovery of introduced parasite.--P. B. Dowden and P. A. Berry, New Haven, report that examinations of the birch leaf-mining sawfly (*Phyllotoma nemorata* Fall.) material collected at Eustis, Maine, revealed the presence of several larvae of the introduced parasite *Phanomeris phyllotomae* Muesebeck. Adults have not yet been reared, but the larvae are very distinctive. This is the second recovery of this parasite in the United States, it having been already obtained from host material collected at Bar Harbor, Maine.

Tests with spreading agents.--S. F. Potts, New Haven, reports that investigations carried on during the last few years on the action on stomach-poison residues of nine different spreading agents showed that the more popular spreaders reduced the initial insecticide deposit by as much as 50 percent in some instances. Most of these spreaders increased the loss caused by weathering. In the arsenicals and bordeaux mixture the copper and arsenic were rendered water-soluble by the spreading and wetting agents, thus causing much more injury to the plant than when these agents were omitted. Observations on the action of spreaders on contact insecticides showed that in some instances the effectiveness of the insecticide was increased, whereas in others it was reduced.

Transmission of Dutch elm disease by bark beetles.--W. D. Buchanan, of the Morristown, N. J., laboratory, reports on experiments conducted in cooperation with C. S. Moses, of the Division of Forest Pathology, Bureau of Plant Industry. In these experiments some small elm trees were exposed to attack by adults of *Scolytus multistriatus* Marsh., and others to attack by adults of *Hylurgopinus rufipes* Eich. The beetles of both species were given equal chances of becoming contaminated with the Dutch elm disease fungus (*Ceratostomella ulmi* (Schwarz) Buisman) before they were confined on the trees. The trees were later cut down, examined, and cultured to ascertain whether they had become infected with *C. ulmi*. Part of the trees were fed on by beetles that were confined to specific spots on the trunks in gelatine capsules. The other trees were fed on by beetles liberated in a drum or cheesecloth cylinder that covered the entire tree. The results are as follows: *C. ulmi* was isolated from 7 of 10 trees (70%) fed on by *S. multistriatus* confined in capsules; *C. ulmi* was isolated from 4 of 9 trees (44%) fed on by *H. rufipes* confined in capsules; *C. ulmi* was isolated from 8 of 19 trees (42%) fed on by *S. multistriatus* which fed at large on the trees; *C. ulmi* was isolated from 5 of 13 trees (38%) fed on by *H. rufipes* that fed at large on the trees; *C. ulmi* was not isolated from 16 trees fed on by beetles not contaminated with *C. ulmi*.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

W. P. A. gypsy moth force reduced.--The services of approximately 50 percent of the W. P. A. employees engaged in gypsy moth work were terminated after the completion of the working period for December, owing to a reduction in W. P. A. funds available for gypsy moth work during the 6-month period beginning January 1, 1938.

Workers withdrawn from woods during deer-hunting season.--Gypsy moth work was interrupted for varying periods of time during December in many sections of the infested areas by the opening of the deer-hunting season in the various States. Crews were withdrawn from woodland areas and employed in scouting open country or in residential areas for the duration of the open seasons, after which they were returned to their former locations. These precautions prevented injury by stray bullets to any member of the Federal gypsy moth forces.

Personal injury record is low despite treacherous field conditions.--All of the territory where Federal W. P. A. gypsy moth work is being performed is now covered with snow ranging in depth from a few inches in the lowlands to 2 feet on the higher elevations. Despite these adverse conditions, there have been relatively few cases of personal injury to the workers while performing their official duties in the field. The low injury record is largely attributable to the experience of the workers, most of whom have been employed on this type of work for a considerable period of time. Scouting work was suspended for 2 or 3 days in the middle of the month over most of the territory, when a severe ice storm coated the trees and highways.

Two towns in eastern Maine found to be lightly infested by the gypsy moth.--Check-up work in Washington County, Maine, was completed about the middle of December. The work was done in eight townships, only two of which were found to be infested. Two infestations totaling 28 egg clusters were found in Princeton, and 2 colonies of 1 egg cluster each were located in Calais. The Canadian Government is continuing similar work near infestations found last year on the east side of the St. Croix River, in St. Stephen and St. Andrews, which are located across the river from Calais.

Large cherry trees endangered by the gypsy moth.--Early in December the agent in charge of gypsy moth scouting, selective thinning, and treatment work in Hampshire County, Mass., reported an infestation in cherry growth in Goshen. The trees, ranging from 1 to 2½ feet in diameter, are valued highly for furniture making, and rarely grow to such large size,

Work in Vermont to be confined to mountainous sections during the remainder of the fiscal year.--With the completion of work in Addison County, Vt., at the end of December, gypsy moth scouting work planned for that State during the remainder of the fiscal year will be confined to towns along the Green Mountain Range, where a large percentage of the area is heavily wooded.

New flood-control reservoir isolates a section where gypsy moth work is in progress.--The flood-control reservoir under construction on the Little River, an important tributary of the Winooski River in northern Vermont, was partially filled with water during a period of heavy rainfall early in December. The impounded water flooded several of the old abandoned roads leading to mountainous areas in the northeastern part of the town of Waterbury, where scouting is now in progress. The cost of scouting this section of Waterbury will be materially increased unless the water recedes sufficiently in the near future so that the old roads can be used in transporting the men to and from their work.

Two infestations apparently eradicated.--A gypsy moth infestation of approximately 100 egg clusters was discovered in Clinton, Wayne County, Pa., and another colony of 325 egg clusters was found in the adjoining township of Dyberry during the fiscal year 1937. Both townships are just outside of the Pennsylvania quarantined area. Intensive exterminative measures applied at these colonies have evidently been entirely successful.

Heavy infestations in Pennsylvania are concentrated in four adjoining townships.--From July 1 to December 1, 1937, approximately 135,000 acres of woodland and open country have been scouted in Pennsylvania, and over 132,000 gypsy moth egg clusters have been destroyed. More than 90 percent of the egg clusters found were in the four townships of Spring Brook, Jenkins, Pittston, and Plains, all located within the most heavily infested area. Only two infestations have been found outside of the area under quarantine. One is barely outside of the quarantined area near the Coolbaugh-Paradise line, and the other is located a few miles northeast of the quarantined area, in the township of Damascus.

New infestation discovered by former gypsy moth employee.--A former W. P. A. gypsy moth employee discovered a new infestation while hunting in a wooded area near Lake Harmony in Kidder Township, Carbon County, in the southern part of the Pennsylvania quarantined area. He reported his find to the supervisory employee in charge of gypsy moth work in a nearby section. The report was confirmed when a hurried examination of the area by the agent disclosed approximately 10 new gypsy moth egg clusters. The wooded area within which the infestation was found was scheduled for scouting later in the season, and the infestation would undoubtedly have been discovered at that time. This, however, does not detract from the value to the eradication campaign of the continued interest in the work which is maintained by former gypsy moth workers. This is the third occasion this year, in the Pennsylvania area, where former employees have located and promptly reported infestations found by them while hunting or working.

Heavy infestation threatens barrier zone.--A gypsy moth infestation estimated at from 2,000 to 3,000 new egg clusters per acre , and which is scattered over several hundred acres, exists in Granby, Hartford County, Conn. This is the heaviest infestation over an extended area that has ever been observed by the C. C. C. personnel in that State. The forest growth in this area consists partly of white oak and gray birch and certain sections are suitable for silvicultural treatment.

Silvicultural treatment controls serious gypsy moth colony.--Coordination of silvicultural methods and gypsy moth treatment work by C. C. C. enrollees has been practiced at a heavy infestation in Shelburne, Mass. Forty large white oaks and 7 old apple trees growing among pines over an area of approximately 4 acres on a high elevation were destroyed. A total of 19,065 new egg clusters, or an average of 4,766 per acre, were creosoted on these trees. The cutting of the trees removed a serious source of windspread of small caterpillars, and left a practically pure stand of white pine which should require no further treatment for the gypsy moth.

PLANT DISEASE CONTROL

Nursery inspection and identification.--During the last summer and fall 46 eastern and midwestern nurseries planning interstate shipment of immune species of Berberis and Mahonia, other than Berberis thunbergii, requested the inspection required before permits are granted. A total of approximately 10,760 acres of nursery stock was inspected. Thirty-three nurseries fulfilled the requirements of Quarantine No. 38 (revised) and were granted permits by the Division of Domestic Plant Quarantines; 9 failed to qualify, and 4 are pending. During these inspections 2,870 susceptible barberry plants were destroyed.

Farmers assist in barberry eradication in Pennsylvania.--During 1937 stem rust spread to virtually all fields of oats and wheat in an area of approximately 150 square miles in eastern Erie County and 200 square miles in western Bradford County, Pa. Some fields of grain within these areas were completely ruined by rust and many of those that were harvested yielded only from 5 to 20 bushels per acre, with the weight per bushel ranging from 12 to 20 pounds. Practically every farm within these areas was found to be infested with barberry bushes, which were definitely established as the principal source of inoculum. As a result of these losses, numerous letters were received from farmers requesting aid in barberry eradication. As emergency funds were not available for further expansion of crew work in Pennsylvania, local meetings of farmers were arranged through the county agent and a procedure was outlined, which they might follow in effectively applying their own efforts toward control. L. K. Wright, in charge of barberry eradication in Pennsylvania, states that, when they are given assistance in organizing the work, the farmers are extremely cautious to locate and properly eradicate all bushes and seedlings. As a result of two cooperative programs, 66,891 bushes and more than 126,000 seedlings have been destroyed on 48 different properties in Bradford County. In Erie County 4 square miles of territory have been surveyed and 31,000 bushes and 85,000 seedlings have been destroyed on 8 properties.

Portable wooden mess halls for blister rust control camps.--In the Inland Empire all Ribes-eradication work is performed by crews quartered in temporary camps. Until 2 years ago little attention was given to the problem of making mess halls fly-proof; however, in 1935 this part of camp sanitation began to assume more importance because of the larger camps and the great number of men working in the forests. To solve the problem of fly-proofing the mess halls it was decided to construct sectional wooden units that could be easily transported, assembled, and dismantled for use in other locations. Eighty of these wooden sectional mess halls were constructed during the spring of 1936. After two seasons of use these units are still in good condition, even though some of them have been taken down and reassembled five times.

Autogiro used in mapping white pine areas.--In connection with blister rust control activities in Monroe County, Pa., an experiment was recently conducted to determine the practicability of mapping white pine areas from an autogiro. Using U. S. G. S. sheets, or enlargements of such maps, the observer indicated the location of the pine areas and classified them according to the amount and size of the pine stocking. The other sections were merely shaded in, to denote that they did not contain sufficient pine to justify protection measures. Although the observer had no previous experience in flying, he was able in 22 hours and 40 minutes of actual mapping time to determine and record conditions on 396,666 acres, or 17,551 acres per hour. The examination of such a large area in the time indicated was possible, owing to the fact that over 95 percent of the area could be covered rapidly because of the lack of white pine. The survey showed that Monroe County contains about 19,200 acres of white pine worth protecting, mostly natural stands. It would have taken a ground crew of four men several months to have accomplished the same results.

Blister rust control operations in sugar pine region of California.--During the field season of 1937 blister rust control operations were conducted in California on four national forest control units--the Plumas, Eldorado, Stanislaus, and Sierra National Forests--and in Oregon on the Rogue River National Forest. With the closing down of field operations early in November the equipment was placed in the warehouses and one winter camp was opened at a lower altitude on the Sierra National Forest, near Mariposa, Calif. All work done in this region during 1937 was conducted under the technical supervision of the Bureau of Entomology and Plant Quarantine and was performed in cooperation with the U. S. Forest Service in the field. Two C. C. C. camps, one on the Eldorado National Forest and the other on the Plumas National Forest, engaged in *Ribes*-eradication work during the summer. The following table shows the results of the control work in California and Oregon during the year, together with averages for man-days and for *Ribes* bushes eradicated on a per-acre basis. Of the total acreage worked, 43 percent was initial and the remainder was reeradication of previously worked areas.

Operation	Total area worked	Total man-days	Total *Ribes* pulled	Per acre-- Man-days	Per acre-- *Ribes*
	Acres	Number	Number	Number	Number
California:					
Plumas [1]	4,172	5,076	488,508	1.21	117
Eldorado	11,715	21,613	2,383,654	1.84	203
Stanislaus	16,847	18,697	3,771,965	1.11	224
Sierra	7,574	18,613	1,745,490	2.45	230
Total	40,308	63,999	8,389,617	1.59	208
Oregon:					
Rogue River	21,355	5,703	990,109	0.27	46
Total for region	61,663	69,702	9,379,726	1.13	152

[1] In addition, 157 man-days were spent by the bulldozer crew clearing 25 acres of willow and *Ribes inerme*. The man-days include the time of the ground crew, and the time spent in piling and burning the slash and in seeding the area to grass.

COTTON INSECT INVESTIGATIONS

Relationship of boll-puncturing insects to internal boll diseases.--L. D. Christenson, of Tucson, Ariz., has submitted a report on his investigations on the nature of "spotting" and "staining" of cotton lint, internal boll rot, and the role of insects in their transmission. These investigations were conducted in cooperation with John T. Presley, of the Bureau of Plant Industry, at Sacaton, Ariz. Previous work by Cassidy and Barber had shown the importance of staining in lowering the grade of cotton and had proved that in Arizona it occurs largely in association with the attack of boll-puncturing insects, the most important of which are the pentatomids Euschistus impictiventris Stal, Chlorochroa sayi Stal, and Thyanta custator F. Cultures were made of the organisms causing the staining and boll rot and a species of bacterium and three fungi were isolated and grown in pure culture. The fungi have been identified by specialists of the Bureau of Plant Industry as Aspergillus niger, A. nidulans, and A. terreus, but the more abundant bacterium has not been identified. Inoculations were made with a hypodermic needle into healthy, surface-sterilized cotton bolls and the wounds were closed by dipping the bolls in hot paraffin. Nearly all bolls inoculated with suspensions of the bacterium showed severe lint staining typical of that prevalent in the fields. The exceptions were large, nearly mature bolls that were about dried out. Inoculations in culture tubes on sterilized cotton fibers of the proper succulency also resulted in typical staining and showed that living tissue was not necessary for the development of the bacterium. The staining or discoloration of the lint progressed from a faint yellowing to a dark brown or almost black. The seed usually remained unaffected, unless pricked by the needle, although in advanced cases of infection the entire contents were rotted to a slimy mass. Bolls inoculated on the outside remained unaffected when no abrasions were present. While the effects of inoculations with the three species of fungi varied somewhat, they were in general characterized by causing internal boll rot, decomposition of the seed, and browning or blackening of the boll walls. Typical staining did not occur immediately, though the lint was ultimately broken down into a flesh-colored or brownish-colored slimy mass and complete destruction of the boll contents resulted. These fungi are also known to cause external boll rot. Of the organisms tested, only the bacterium caused staining similar to the type most common in Arizona, although there may be other organisms concerned, which were not worked with. Cotton bolls protected from insects by sacks did not become infected and in the dissection of 2,200 field-infected bolls all were found to have been punctured by insects. The pentatomids previously determined by Cassidy and Barber as responsible for causing lint staining were allowed to puncture healthy bolls from time to time to determine whether they consistently caused staining. It was found that not all of the field-collected individuals caused staining and that the infective organisms were present primarily as superficial contamination of the mouth parts, which could be eliminated by surface sterilization in a mercuric chloride-alcohol solution. In the fields under observation the incidence of staining and boll rot was correlated with the seasonal abundance of the insects.

Overwintering pink bollworm larvae enter soil at different dates.--Additional data on the relative numbers of pink bollworm larvae entering hibernation at different dates were obtained by A. J. Chapman and H. S. Cavitt at Presidio, Tex., this fall. In a block of uniform cotton all of the fruit was stripped from the plants in the plots on October 1, October 15, November 1, and November 15. Most of the overwintering larvae that leave the bolls had emerged and entered the soil by November 15, as the temperatures are too low for much activity after that date. Approximately a month after the last date of stripping the plants, 10 square yards of soil from each plot was examined for larvae. It was found that 12 percent of the hibernating larvae had entered the soil by October 1, 66 percent by October 15, 70 percent by November 1, and 100 percent by November 15. As a further check, mature larvae were allowed to emerge naturally from cotton bolls and were placed in cages over soil within 24 hours after emergence. Four cages, each containing 1,500 larvae, were examined 3 weeks after the last installation. An average of 24 percent of the total number of larvae was recovered as hibernating larvae in the soil. Computed on the basis of total recoveries, the following percentages of the larvae placed in the cages at different dates were recovered as hibernating larvae: September 16-30, 17.6 percent; October 1-15, 58.5 percent; October 16-31, 80.8 percent; November 1-15, 100 percent. These results agree with the previously mentioned stripping tests in that the optimum period for the development of hibernating larvae was October 1-15. Although these tests are subject to a number of experimental errors, they indicate that early maturity of the crop and an early clean-up of the fields are important factors in reducing the pink bollworm carry-over in the soil.

Balloon drifts in relation to flea hopper dispersal.--The final results of balloons released in May and June to obtain data on the relation of air currents to the dispersal of the cotton flea hopper have been reported on by J. C. Gaines, of the Texas Experiment Station, and K. P. Ewing, of the Port Lavaca, Tex., laboratory. Of the 3,334 balloons released in 17 counties in south-central Texas, 346, or 10.4 percent, were recovered and the identification tags were returned by the finders. The maximum distance covered by any recovered balloon was 375 miles. Each of three balloons drifted over 300 miles, an average of 341 miles in 19 hours, or 17.9 miles an hour. Twelve of the balloons recovered on the same day released had drifted an average of 62.4 miles in 4.7 hours, or 13.3 miles per hour. Most of the recoveries were from comparatively short distances, the average drift being 42.6 miles. The prevailing direction of the drifts was to the north and northeast. The releases were made in areas of light soil where there were large quantities of Croton, the principal host plant in which overwintering flea hopper eggs are laid. The general directions of recoveries were toward the black-land areas where Croton does not grow abundantly but where the flea hopper damage to cotton is more severe than in the sandy areas. These experiments and the catching of flea hoppers on airplane traps at 2,000 feet elevation indicate that flea hoppers could drift or be carried by wind currents for long distances from the hopper-infested Croton to cotton fields.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Inspection.--Gin-trash inspection was continued in the Salt River Valley and Coolidge-Casa Grande sections of Arizona until December 10. At that time the trash was becoming more bulky, indicating that the most favorable period for inspection had passed; therefore the operation of the machines was discontinued. Five crews had been operating, and as conditions were ideal a large volume of trash had been inspected. The only finding in the above area was one specimen at Casa Grande in November. Since the above work was discontinued the men have been engaged in the inspection of green-boll samples at the San Antonio laboratory. The results have been negative.

Destruction of stalks.--In the lower Rio Grande Valley of Texas there are less than 500 acres on which 1937 stalks are still standing, and these areas are scattered. All of this acreage belongs to nonresident owners and in many instances we have been unable to contact them. The land was planted by squatters and it has also been impossible to locate them. Some of the stalks that were cut but not uprooted put out new growth. A careful check has been kept on this situation and none of the plants have been allowed to produce fruit. By the end of December preparations were begun for the coming cotton crop and soon all of the acreage will have been plowed. Considerable rain in December put the land in excellent condition for plowing.

Road-traffic inspection.--At the Marfa, Tex., road station 1,057 cars were inspected in December and 11 interceptions of contraband material were made. Of this number, three were infested with the pink bollworm, three living and one dead larvae being found. In past years the station has been closed about the first of January but this year no field clean-up is being carried on, consequently the station will be operated as long as there is danger of infested material being taken out of the area. Fewer interceptions have been made this season, indicating that educational work done by the inspectors is having good effect.

Wild cotton.--Satisfactory progress has been made with the eradication of wild cotton in southern Florida. A considerable area has already been completed along the west coast and the upper counties are now being cleaned for the second time this season. All of the plants found consist of small seedlings which have recently come up and none of which have fruited. Excellent progress has been made at Cape Sable, where a camp was set up the latter part of November. Although a large number of plants were found, there has been a considerable decrease as compared with former cleanings. During the month 3,898 acres was covered and 254,296 seedlings and 571 sprout plants were removed. Of this number only 1,338 plants contained bolls and most of these were at Cape Sable. In addition, 325 acres was covered without finding any wild cotton.

Thurberia-plant eradication.--Satisfactory progress has also been made with the eradication of Thurberia plants in the Santa Catalina Mountains of southern Arizona. The new camp is now in full operation, with a good supply of water available and little chance of a shortage. The area being worked is very rough and contains a considerable number of Thurberia plants. It is estimated that about 30 work days will be required to complete the area available from this camp. During the month 2,360 acres was covered and 18,231 Thurberia plants were destroyed, making a total to date of 112,245 acres covered in the Santa Catalina Range and 1,158,070 Thurberia plants destroyed.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Rotenone-containing dust mixtures control pea weevil.--Reports by F. G. Hinman and R. A. Fisher, of the Moscow, Idaho, laboratory, on the research work accomplished last summer in the Blue Mountain area of eastern Washington and Oregon, in cooperation with the Pea Insect Control Committee and the State experiment stations, show very favorable results in controlling the pea weevil by the use of rotenone-containing dust mixtures. Extensive field examinations showed that the use of hoods on the large dusting machines increased the efficiency of these dusts. When hoods were used, the average reduction in weevil population was estimated to be 98.6 percent, when treated with dust mixtures containing 1 percent rotenone, as compared with 94.6 percent when hoods were not used. When hoods were used for the application of dust mixtures containing 0.75 percent rotenone, the reduction in weevil population was approximately 98.1 percent, as compared with 90.0 percent control without the aid of hoods. These data are based on results obtained when applications of the dust mixture ranged from 25 to 45 pounds per acre. Satisfactory results were obtained with applications of 25 pounds of the dust mixture containing 1 percent rotenone per acre, therefore a heavier dosage is not considered necessary. No appreciable difference could be detected in the percentage of weevil control obtained with dust mixtures containing 1.0 or 0.75 percent rotenone when the quantities applied per acre were practically equivalent. Results obtained indicated, however, that dust mixtures containing less than 0.75 percent rotenone might not result in satisfactory control. Although unsatisfactory results were obtained in experiments whereby undusted strips 30 feet wide were left between each trip of the large field dusters, a reduction of approximately 82 percent in weevil infestation was found in such undusted strips, indicating that the applications of dust mixtures have an effect on adult weevil populations on undusted parts of fields. A close correlation was found between the recorded adult weevil populations obtained by sweeping with an insect net and the percentage of weevil-infested peas at harvest time. It is believed that the use of early planted border strips as traps materially reduced the acreage of peas that would otherwise have needed dusting in the Blue Mountain area through the concentration of the early emerging weevils on such strips and their ultimate destruction by plowing under. Observations in 1937 demonstrated, however, that unless these trap plantings were destroyed before the congregated weevils dispersed to the inner parts of the field, such strips may become an important source of pea weevil infestation to the main part of the crop. Similar satisfactory results against the pea weevil with dust mixtures containing rotenone are reported by J. C. Chamberlin, of the Corvallis, Oreg., laboratory, who conducted large-scale field tests with this insecticide in peas grown in the Willamette Valley for canning or for special processing, in cooperation with the State experiment station and the canners.

Parasitization of the European earwig.--C. W. Getzendaner, of the Puyallup, Wash., laboratory, reports that, to the close of last October Bigonichaeta setipennis Fall., the imported parasite of the European earwig, has been liberated at 20 different points in Washington, Idaho, and Oregon, during the 4-year period 1934-37, inclusive. Recoveries of this parasite have been made at or near 15 of the colony sites. Three of these recoveries were made, however, only during the year when the parasites were released and not subsequently, whereas two other recoveries were made from colonies released in 1937. It is believed that the parasites are definitely established at the remaining 10 colony sites. Recoveries have been made at sites where the original liberation consisted of as few as 10 to 25 B. setipennis adults, indicating that it may be possible to obtain establishment of this parasite by liberating a comparatively small number of individuals.

Relation of time of planting to curly-top damage to beans.--In summarizing the field-plot experiments with beans in southern Idaho in 1937, A. O. Larson, of the Twin Falls, Idaho, laboratory, reports that beans of the variety "Bountiful," known to be highly susceptible to curly-top disease transmitted by the beet leafhopper, were planted at intervals during the period from May 10 to June 28, in an attempt to discover the relation between the date of planting and the degree of resulting curly-top disease. In general, the earliest planted beans showed the lightest infection. Approximately 14.7 percent of the beans planted on May 10 showed evidence of curly-top disease, whereas 61 percent of those planted on June 3 were diseased. A corresponding decrease in yield was recorded. Last year the beans planted on June 3, the day after the migration of the beet leafhopper from the wild to the cultivated area, were the most heavily infected by curly-top disease up to that time, and the next planting, made 4 days later, had the next heaviest infection. Beans that were up 2 weeks before the first leaf hopper migration suffered the least injury. All plantingsof beans made after the migration had begun (June 2) were infected more heavily than were the first three plantings, which were up before that date.

Biology of tomato worm on tobacco in Florida.--In reporting on biological studies of Protoparce sexta (Johan.) on tobacco in Florida, A. H. Madden and F. S. Chamberlin, of the Quincy, Fla., laboratory, state that the attack of the tomato worm in the Quincy district in 1936 and 1937 was confined principally to tobacco, although this species is considered primarily a pest of tomatoes. In the insectary the duration of the egg stage averaged 4.9 days, the larval stage 19.5 days, and the pupal stage 151.7 days. In a few instances the pupal period required almost 2 years. Three complete generations and a partial fourth generation occur each year at Quincy. The maximum seasonal abundance of larvae is reached the middle and latter parts of July, corresponding to the period of maximum growth of the tobacco plants. Although various natural enemies, including several species of parasites, predators, and a bacterial disease, attack the tomato worm in the Quincy district, their combined effect has but little influence, because such enemies exhibit their greatest activity after the harvest of the crop. In the absence of a satisfactory insecticide for combating the tomato worm, the data obtained in these studies substantiate the practiciability of supplemental control methods, including the destruction of the tobacco stalks directly after harvest, fall plowing of infested tobacco fields, and the use of moth traps.

Rotenone-containing compounds give good control of Mexican bean beetle in Colorado.--In summarizing the results of tests performed with insecticides against the Mexican bean beetle in Colorado in 1937, R. L. Wallis, of the Grand Junction, Colo., laboratory, reports that sprays containing derris and cube gave better results than any other materials tested, the increase in yield ranging from 10.4 to 48.7 percent over the check plots; that cryolite sprays gave the next best results, yielding from 7.0 to 18.9 percent increase in yield over the check plots; and that sprays containing zinc arsenite were third in importance, giving an increase in yield of 8.3 to 13.3 percent, as compared with the untreated plots. Sprays containing calcium arsenate-lime or barium fluosilicate gave poor results.

Late planting reduces wireworm injury to potatoes.--K. E. Gibson, of the Walla Walla, Wash., laboratory, reports that results in 1937 corroborated those of previous years in demonstrating that, in general, the damage to potato tubers by wireworms, principally *Limonius californicus* Mann. and *L. canus* Lec., was reduced greatly by late planting. Potatoes harvested from plots planted on May 5, May 20, June 5, and June 20, showed a progressive decrease in the percentages of injury to tubers, i. e., 76, 46, 33, and 25 percent, respectively.

Biology of sweetpotato leaf beetle.--L. W. Brannon, of the Norfolk, Va., laboratory, reports that biological studies on the sweetpotato leaf beetle (*Typophorus viridicyaneus* Crotch.) in 1937 showed that, from a total of 268 adults collected in the field on June 15 and caged with food, approximately 31 percent were dead at the end of June; 72 percent at the end of July; 87 percent at the end of August; and 98 percent at the end of September. The last beetle died on October 20, after a life span of slightly over 4 months. These data indicate that the adults of *T. viridicyaneus* are capable of depositing eggs over an extended period, although it was not possible to find beetles under natural conditions in Currituck County, N. C., later than a month after their first appearance in June. The caged individuals reported on in these tests deposited eggs during the period from July 1 to September 8.

INSECTS AFFECTING MAN AND ANIMALS

Wool-maggot fly reared at high temperature.--C. C. Deonier, of the Tempe, Ariz., laboratory, reports that he has been able to rear *Phormia regina* Meig. through two successive generations at temperatures of approximately 99° to 106° F. The larvae matured in 3 days, the pupae in 6 days, and the preoviposition period was 5 days in the first generation. In the second generation 15 days were required from adult emergence to adult emergence. This fly is ordinarily considered a cold-weather species and with the onset of high summer temperatures it rapidly disappears from Southern and Southwestern areas. The findings in these experiments indicate that there may be a thermophilic strain of *P. regina* in the Western States.

Insects damage pickle barrels.--E. A. Back, Washington, D. C., reports an interesting and rather unusual case of damage caused by insects recently at New Lebanon, Ky. Considerable difficulty was experienced in a pickle factory in keeping the brine in which the pickles were preserved from leaking out of the barrels after the pickles had been packed for shipment. A close examination of the defective barrels showed that a large number of them were riddled with tiny holes and further observation revealed the presence of a small bostrichid, *Pterocyclon fasciatum*. Apparently, the wood was attacked after the barrels had been filled with brine. Practically all the oak barrels at the plant were damaged, while those made of cypress and other woods were free from infestation.

"Tagette" oil apparently of little value as a repellent for blowflies in Southwest.--Oil of tagetes, an essential oil derived from certain species of plants belonging to the genus *Tagetes*, has recently received some publicity as a very promising blowfly repellent in Africa. Roy Melvin and E. W. Laake report that tests with this material against adults of *Cochlionyia americana* C. and P., *C. macellaria* F., and *Phormia* sp., made in nature and under laboratory conditions at Menard and Dallas, Tex., show that it is practically worthless in protecting the wounds of animals against infestations by these species of blowflies.

Toxicity of petroleum-base pyrethrum sprays.--From the results of recent experiments, C. W. Eagleson, Dallas, Tex., reports that the toxicity of petroleum-base pyrethrum fly sprays to *Musca domestica* L. increases as the boiling point of the base to a critical point, and that when fractions boiling above this critical point are the principal bases, a reversal in slope of the recovery curve is obtained from flies sprayed with pyrethrins dissolved in these fractions. The resistance of *Stomoxys calcitrans* (L.) to pyrethrum sprays is less than one-fiftieth of that displayed by *M. domestica*.

FOREIGN PARASITE INTRODUCTION

Parasite importations in 1937.--The following table gives a record of importations into the continental United States during the year. These shipments were assembled by the two foreign stations of the Division, with the exception of those of *Chelonus annulipes*, *Collyria calcitrator*, *Microplectron fuscipennis*, and *Leucopis obscurus*, which were received through the courtesy of the Canadian Department of Agriculture, and of *Gambrus stokesii*, received from the Australian Council for Scientific and Industrial Research.

Hosts and parasites	Country of origin	Parasites shipped	
		Number	Stage
Oriental fruit moth:			
Gambrus stokesii Cam.	Australia	429	Cocoons
Dioctes molestae Uch. Macrocentrus thoracicus Nees. Eubadizon extensor L. Orgilus longiceps Mues. Apanteles spp. Pristomerus spp. Bassus spp. Misc. Hymenoptera	Japan, Chosen	40,468	Cocoons
Phaeogenes haeussleri Uch.	Japan	5,092	Adult females
Elodia spp.	Japan, Chosen	769	Puparia
Perisierola sp.	Japan	187	Adult females
Do.	Japan	500	Cocoons
Citricola scale:			
Coccophagus spp.	Japan	97	In living hosts
Coccinellidae spp.	Japan	29	Larvae
European corn borer:			
Phaeogenes nigridens Wesm.	Italy	8,280	Adults
Chelonus annulipes Wesm.	Canada	8,715	Adults
Hessian fly:			
Platygaster pleuron Walk.	France	1,039	Adults
Trichacis remulus Walk.	France	855	Adults
Black wheat-stem sawfly:			
Collyria calcitrator Grav.	Canada	5,100	Adults
Vetch bruchid:			
Triaspis thoracicus Curt.	France, Austria	30,570	In infested beans
Uscana semifumipennis Gir.	France	1,000	In host eggs
Lima bean pod-borer:			
Microbracon spp.	France	90	Adults
Do.	France	3,840	Cocoons
Phanerotoma planifrons Nees.	Hungary	6,004	Cocoons
Do.	Hungary	3000-4000	In host larvae
European pine shoot moth:			
Copidosoma geniculatum Dal.	Holland	[1]100,000	In dead host larvae
Omorgus borealis Zett. Orgilus obscurator Nees. Cremastus interruptor Grav. Misc. Hymenoptera	Holland	3,656	Cocoons
Lypha dubia Fall. Actia nudibasis Stein.	Holland	488	Puparia
Larch case-bearer	Holland	53,430	Host-larval cases
Spruce sawfly:			
Microplectron fuscipennis Zett.	Canada	[2]1300000	Adults
Fir bark louse:			
Leucopis obscurus Hal.	Canada	569	Adults

[1] Estimated

[2] Approximate

FOREIGN PLANT QUARANTINES

South American bollworm intercepted.--A larva of the South American bollworm (*Sacadodes pyralis* Dyar) was intercepted at New York on February 13, 1937, in a cotton seed in baggage from Colombia. A larva of this noctuid was also taken at New Orleans on March 28, 1937, in seed cotton used as packing in baggage from Panama. The larva attacks the cotton boll. It has also been recorded from Trinidad, Venezuela, Argentina, and British Guiana.

Corn diseases.--The corn disease quarantine (F. H. B. 24), which became effective July 1, 1916, was based primarily on four known diseases. These were named in the quarantine as *Peronospora maydis* Raciborski, *Sclerospora sacchari* Miyake, *Physoderma zeae-maydis* Shaw, and *Physoderma maydis* Miyake. Not long after the quarantine became effective it was found that *Physoderma zeae-maydis* was already well established in this country, especially in the South. In 1937 *Peronospora maydis*, now known as *Sclerospora maydis* (Rac.) Palm, was reported as occurring in Belgian Congo. Other downy mildews of corn that are not known to occur in the United States but have been reported as occurring in Africa are *S. philippinensis* Weston, in the Union of South Africa; *S. sorghi* (Kulk.) Weston and Uppal, in Egypt and Tanganyika; and an undetermined species of *Sclerospora*, occurring in Uganda. There are other records of doubtful status. *S. philippinensis* is rather well distributed in the Orient and often is responsible for severe damage. These reports of dangerous downy mildews of corn in another part of the world may necessitate an amendment to or a revision of the corn disease quarantine.

Entomological interceptions of interest.--Two living larvae of the Mexican fruit fly (*Anastrepha ludens* Lw.) were intercepted at Hidalgo, Tex., on August 22, 1937, in a sweet lime in baggage from Mexico. Living larvae of the melon fly (*Dacus cucurbitae* Coq.) were collected on July 19, 1937, in cucumbers in the field in Guam. Two living larvae of the plutellid *Acrolepia assectella* Zell. were taken at Baltimore, Md., on November 3, 1937, on leek (*Allium porrum*) leaves in ship's stores from the Netherlands. Living adults of the hairy vetch bruchid (*Bruchus brachialis* Fahr.) were intercepted at Philadelphia on October 25, 1937, in vetch seed found in wheat-straw jackets used as packing for vermouth in cargo from Italy. A living larva of the Asiatic rice borer (*Chilo simplex* Butler) arrived at San Pedro, Calif., on September 7, 1937, in rice straw in passenger's baggage from Japan. Two living larvae of the weevil *Curculio elephas* Gyll. were found at Chicago, Ill., on November 8, 1937, with chestnuts in the mail from Italy. A living specimen of the cicadellid *Exitianus obscurinervis* Stal was intercepted at Brownsville, Tex., on October 21, 1937, on a marigold in cargo from Mexico. Two living larvae of the European corn borer (*Pyrausta nubilalis* Hbn.) were taken at San Francisco on August 12, 1937, in string beans in ship's stores from Japan. Twenty-eight living adults of *Bruchus rufipes* Host. were found at New Orleans on August 6, 1937, in spring vetch in cargo from Hungary. A living adult of the cerambycid *Phytoecia rufiventris* Gaut. arrived at Seattle, Wash., on October 15, 1937, in a chrysanthemum stalk in ship's quarters from Japan. Workers of the ant *Iridomyrmex iniquus* var. *nigella* Emery were intercepted at Washington, D. C., on November 1, 1937, in a wild orchid in the mail from Costa Rica.

Pathological interceptions of interest.--*Ascochyta achlydis* Dearness was intercepted for the first time on July 13 at Blaine on *Achlys triphylla* from British Columbia. The conidia were larger than the description calls for. An undetermined bacterial spotting of pumpkins from Japan was collected at Baltimore on November 4. The lesions resembled those produced by *Bacterium lachrymans* Smith & Bryan but this pathogen is not reported from Japan and is not known to attack pumpkin. *Gloeosporium* sp., unlike any recorded species, was found on December 5 at Boston on globe artichokes from England. *Hendersonia oryzae* Miy., first interception, was found on rice straw mats used as packing for cargo from Japan on December 28 at Philadelphia. *Heterosporium trillii* E. & E., first interception, was found on *Trillium ovatum* from British Columbia on July 13 at Blaine. *Melanospora* sp., asci and spores abundant, was intercepted on water chestnuts from Japan on December 14 at Buffalo. *Myrothecium verrucaria* (A. & S.) Ditm., first interception, was found on tomato from Mexico on April 30 at Nogales. Asci, as well as conidia, of a *Nectria* species were found on ginger root from China intercepted at Buffalo on December 14. There was so little of the perfect stage and secondary organisms were growing so strongly that a determination of the species was not practicable. The first interception of *Oidium hortensiae* Jors. was made on June 20 at Boston on hydrangea from Scotland. *Phoma rimosa* West. was intercepted for the first time on May 26 at New York on a cargo shipment of reeds (*Phragmites communis*) from Holland. *Puccinia tageticola* Diet. & Holw. was intercepted on *Tagetes* sp. (*T. tenuifoliae*?) from Mexico on April 26 at New York. *Sclerotium* sp., apparently distinct from *S. rolfsii* Sacc., was intercepted in mango seeds in baggage from Sierra Leone on June 21 at Philadelphia.

DOMESTIC PLANT QUARANTINES

Activities relating to white-fringed beetle-control project.--Careful inspection of places adjoining the known infested properties in the Florala, Ala., area in December resulted in finding 15 additional infested properties totaling 793 acres. From July 22, when the work was started, to the last of December, 940 properties totaling 15,720 acres have been found to be infested. The largest control areas are in Okaloosa and Walton Counties, Fla., and in Harrison County, Miss., each of the three counties having over 4,000 acres infested. The other infestations are located in Florala, Ala., Pensacola, Fla., Laurel, Landon, and McHenry, Miss., and New Orleans, La. Thirty-nine percent of the infested area in the four States consists of cultivated land. A complete survey of the barrier ditch was made in December and close supervision was given the handling of the farming effects and crops of the 266 tenants who moved from the regulated areas in December.

Crop-production surveys in white-fringed beetle area.--Inspectors who surveyed and platted the crops in the quarantined areas of Florida and Alabama found that there were 51,000 acres of crops in the area, produced by 1,300 farmers. The estimated value of $545,914, based on actual surveys and units such as bales of cotton and wagonloads of corn, was taken as very nearly accurate. The acreage of woodland and uncultivated land is also being determined, as these types represent distinct factors in the eradication program.

Phony peach and peach mosaic eradication.--Tree-removal was continued in December in Alabama, Arkansas, California, Colorado, Georgia, New Mexico, Tennessee, and Texas. Although special attention is directed toward diseased trees, abandoned orchards are also removed, as well as wild and escaped trees which are still found in the Eastern States. Of the force of 476 relief employees, 65 percent are working on the peach mosaic project. In the Palisade district of Colorado, notwithstanding the fact that tree-removal has been in operation since 1935, growers have cooperated with the project and replanted to the extent of an increase of 80,000 trees over the number grown when the work was begun. In California the results of the year, as compared with those of 1936, show satisfactory progress.

Sweetpotato weevil work.--Eradication activities carried on in December throughout the sweetpotato weevil infested areas of Alabama, Georgia, Mississippi, and Texas consisted of having all infested fields cleaned of any remaining host-food material. Throughout the infested areas, inspectors have had considerable success in having fields replowed, following the cold weather. Storage banks are being inspected and where infestation is found the owners are induced to destroy the tubers or feed them to stock. The practice in certain areas of paying laborers with sweetpotatoes in lieu of cash has necessitated a careful check of such farm-to-farm movement. Small markets are also inspected to prevent the distribution of tubers from infested properties. The trapping of weevils by placing occasional clean tubers in fields from which all other host food has been removed is continued with satisfactory results. Inspections of these various types, by 16 Federal and 18 State inspectors, resulted in finding 60 infestations in the 4 States. Local broadcasts by the county agent of Thomas County, Ga., and a moving picture by the Georgia department of entomology, showing damage caused by the sweetpotato weevil, have rendered considerable assistance to the work of the project. A survey of this important sweetpotato-producing county was completed in December and eradication measures were put into effect on the 22 properties on which infestation was found.

Transit inspection.--Transit inspectors throughout the 21 cities in which work was conducted in December report a greatly increased movement of citrus fruit from Texas. These shipments and carlots are inspected for certificates required under the Mexican fruit fly quarantine. Christmas-tree interceptions from the gypsy moth area in New England were greatly increased at New York and Boston through the assignment of additional inspectors from the gypsy moth project, and the inspection of truck movement of Christmas trees and Christmas greens at the New York City flower-market district, where some apparently willful violations were caught. Although New England Christmas trees were inspected at nearly all stations, inspectors report that large numbers of such trees are shipped from the Northwestern States and from Canada. At Chicago the December freight arrivals consisted of 83 cars of Christmas trees from Canada, 96 from Montana and Washington, and 46 from New England. Nursery stock other than fruit trees showed increased shipping over November at Indianapolis, Cincinnati, and Southern points.

Citrus canker in Louisiana and Texas.--Three *Citrus trifoliata* trees were recently found infected on the water's edge, one on Bayou La Fourche in Assumption Parish, and two in La Fourche Parish, all in the vicinity of sites where canker was previously found. In Galveston County, Tex., infection was found on nine *Citrus trifoliata* seedlings recently germinated on a spot where trees had been eradicated; on five such seedlings ¼ mile from an old infection; and on one seedling orange on a property not previously known to be infected.

CONTROL INVESTIGATIONS

Response of insect heart to electrical stimulation.--J. F. Yeager, of the Beltsville, Md., laboratory, reports that electrical stimulation of the heart of *Periplaneta americana* L. (in isolated, perfused preparation) has shown that this insect's heart can give responses that are somewhat different from the responses usually given by the perfused vertebrate heart. The stimulated roach heart gives extrasystoles throughout the periods of relaxation and rest but no compensatory pauses following the extra contractions, shows marked summation of contractions, shows an apparent response (summated contraction) to stimulus during most of the contraction period, can exhibit complete cardiac tetanus with rapid recovery at the end of stimulation, may show apparent treppe or staircase effect, can exhibit summation of stimuli, and appears to have a relatively short absolute refractory period. These responses seem to place the cardiac muscle of this insect somewhere between vertebrate skeletal muscle and vertebrate cardiac muscle, when considered from the functional standpoint. Histologically, the roach cardiac muscle is striated.

Few compounds have characteristics of good insecticide.--During the year 1937 approximately 250 organic compounds were tested for insecticidal action on mosquito larvae by A. M. Phillips, of the Sanford, Fla., laboratory. Of this number only 34 had any appreciable toxicity and a bare half dozen approached the toxicity of standard insecticides. Of the 500 samples tested on several species of leaf-feeding pests by M. C. Swingle and James B. Gahan, 65 gave good control of first-instar larvae and less than 10 filled the requirements of toxicity to full-grown larvae and lack of injury to foliage. In other words, only 1 sample out of every 100 tested gives any definite promise as an insecticide.

INSECTICIDE INVESTIGATIONS

Study of quassia continued.--E. P. Clark, of this Division, has found that the bitter insecticidal constituent of quassia wood (*Quassia amara*) is a mixture of quassin, which has a melting point of 206° C., and neoquassin, which has a melting point of 226°.. These materials are isomeric and have the molecular formula $C_{22}H_{30}O_6$. A method for the preparation and purification of these compounds and some of their reactions have been described in two recent publications (Jour. Amer. Chem. Soc., vol. 59, pp. 927-931 (May 1937) and pp. 2511-2514 (Dec. 1937)).

New solvents for rotenone.--H. A. Jones and S. Love have determined the solubility of rotenone at 25° C. in 55 solvents not hitherto reported. Rotenone is more soluble in methylene chloride (58.2 g of rotenone in 100 g of solvent) than in any other material. Rotenone is also quite soluble in benzaldehyde, pyridine, nitrobenzene, furfural, and U. S. P. cresol. These results are published in the Journal of the American Chemical Society (vol. 59, pp. 2694-2696. Dec. 1937).

Determination of oil deposit on sprayed foliage.--L. H. Dawsey and J. Hiley have described an improved weighing method for the determination of oil deposit on chrysanthemum foliage after spraying with emulsions. The method is applicable to nearly all kinds of nonvolatile insecticidal oils, including both petroleum oils and fatty oils. The procedure consists of four steps: (1) Cutting leaf disks in preparation of samples, (2) extracting samples, (3) evaporating the solvent, and (4) drying residues to constant weight. Recovery of oil from chrysanthemum foliage is 100 percent (Jour. Agr. Research, vol. 55, pp. 693-701, Nov. 1, 1937).

Some physical properties of commercial paris green.--L. D. Goodhue and E. L. Gooden (Jour. Econ. Ent., vol. 30, pp. 913-917. Dec. 1937) have reported the results of an examination of nine commercial brands of paris green. These were found to vary widely in particle size, density, cubic inches per pound, and angle of slope. The values for cubic inches per pound were in approximately the same order as the results of particle-size determination by sedimentation analysis, and may be used as a rough measure of the fineness of paris green.

Paris greens prepared from animal and vegetable oils.--F. E. Dearborn, of this Division, has described (Jour. Econ. Ent., vol. 30, pp. 958-962. Dec. 1937) a procedure for making homologues of paris green from various animal and vegetable oils, including castor, coconut, cottonseed, corn, fish, peanut, and soybean oils. Fassig and Campbell, of the Ohio State University, have reported (Jour. Econ. Ent., vol. 30, pp. 681-682) that some of the greens prepared from oils are more effective than ordinary paris green, which is made from acetic acid.

BEE CULTURE

Queen introduction needs further study.--C. L. Farrar, Laramie, Wyo., reports: "The introduction of queens under fall conditions on a commercial scale by the spray-direct release method gave very disappointing results, as compared with those obtained during the summer. The spray-direct release method of introduction gave definitely poorer results than were obtained by cage introduction the previous two seasons. All queens appeared to arrive in good condition, except two which had dead attendants; one of these was lost, the other successfully introduced. The results were sufficiently variable to indicate that the spray method may still have possibilities." The actual loss reported in the study of the spray-direct release method of introduction this fall is 19.8 percent of a total of 207 queens. Robbing is ruled out as an appreciable factor in this loss by the statement, "Robbing reached serious proportions in only one yard. Three queens out of 26 (11.5 percent) were lost, which was considerably less than the average loss for the other yards." The following conclusion is given: "In general, these losses are not inconsistent with the experience of commercial beekeepers carrying out queen introduction on a large scale; however, the extent of these losses emphasizes the importance of finding a safe method of introduction."

Supersedure causes heavy loss.--Mr. Farrar reports as follows on 50 packages received at Laramie on June 5 for use in the supersedure studies: "10 queens, or 20 percent, were lost between June 5 and August 24, although 4 of these were probably lost because of manipulation. Neither variation in the pollen factor while the queens were being reared nor the length of time the queens were laying in the nuclei appeared to influence losses."

Mutations obtained by use of X-ray.--Otto Mackensen reports that a number of mutations of the honeybee have been obtained at the Baton Rouge, La., laboratory by the use of X rays and that the results indicate a mutation rate of 12-1/2 percent for the germ cells tested. In describing the mutations he states: "One of the mutations causes thickenings and branches on the veins of the hind wing; the other a weakened chitinization of the posterior portions of the abdominal sclerites causing irregular posterior margins and often holes through the sclerites near their posterior margins. The phenotypic expression of both varies considerably and may overlap the normal condition. The mature drones carrying either mutation are very weak and some of them live long enough to become sexually mature."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

West Indian sweetpotato weevil.--It has recently been pointed out by E. C. Zimmerman, of the Bernice Bishop Museum, that the correct technical name for this insect is Euscepes postfasciatus Fairm., the specific name postfasciatus antedating batatae Waterh.

Another European weevil in North America.--W. J. Brown, of the Canadian Entomological Branch, has deposited in the National Museum collection several specimens of Sitona lineatus L., collected on green pea seedlings at Victoria, British Columbia, in May 1937. The species is common and widely distributed in Europe, but has not before been reported from North America.

Larva of a parasitic lepidopteron received.--A lepidopterous larva attached to the body of the fulgorid Oliarus concinnula Fowler was received from William F. Turner, of the Division of Fruit Insect Investigations. The fulgorid, with the parasite attached, had been swept from plum foliage in Brown County, Tex. Carl Heinrich identified the larva as Epipyrops sp. Larvae of this genus are seldom received, this being the third specimen to come to the National Collection. The genus Epipyrops belongs to a small family (Epipyropidae) of wide distribution, all of whose species, as far as known, are parasitic on Homoptera.

UNIVERSITY OF FLORIDA
3 1262 09243 4538

Notes on ant identification.--Workers of the tiny black ant *Monomorium minimum* (Buckley) were sent in for determination by J. U. Gilmore, with the statement that they were eating flea beetles at Oxford, N. C., the latter part of June 1937. Specimens of ants collected at Anacoco, La., on December 12, 1937, and submitted to the Division of Insect Identification by K. L. Cockerham have been determined by M. R. Smith as the Texas leaf-cutting ant (*Atta texana* (Buckley)). Mr. Cockerham states that he collected the ants from collards, turnips, and onions, where they were cutting the leaves and causing considerable damage.

New record of an aphid on tulip.--*Rhopalosiphum nymphaeae* (Linn.) was identified by P. W. Mason from tulip bulbs from Holland, intercepted at Detroit (Detroit No. 1931). This common aphid usually migrates between plum and various aquatic plants, sometimes living partially submerged beneath the water, and at times being injurious to aquatic plants in greenhouses. Its presence on tulip bulbs is very unusual and not previously reported.

Preparation of soft-bodied insects.--Soft-bodied insects, such as wingless crickets, wingless blister beetles, and termites, are rarely found satisfactorily preserved as pinned specimens. Because of distortion and shrinkage they are often not readily recognized as the species they represent. Excellent permanent preparations of such material can be made, however, by the following method which has been outlined by H. S. Barber: The insects are killed and fixed in 95 percent alcohol. When moderately hardened the membranes and coagulated viscera are punctured with a fine micro pin to facilitate complete dehydration in absolute alcohol. The specimens are then placed in xylol or benzol to clear them and to remove any remaining soluble fats. After this they are allowed to dry and are then in condition for permanent preservation. If it is desired to pin the insects through the body this is done after hardening in 95 percent alcohol, before complete dehydration. It has been found more generally satisfactory, however, to puncture the right side of the insect with a scalpel and to insert a suitable card point coated with an adhesive, the pin later to be run through the base of the triangle.

---oOo---